

SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-43

Name: Cavour Lake

County: Beadle

Legal Description: T111N- R60W-Sec. 20-22

Location from nearest town: 2-1/2 miles north of Cavour, SD

Dates of present survey: July 7-8, 2010

Date last surveyed: June 25-26, 2008

Managed Species	Other Species
Black Crappie	Northern Pike
Walleye	Common Carp
Black Bullhead	White Sucker
	Yellow Bullhead
	Yellow Perch

PHYSICAL DATA

Surface Area: 230 acres

Maximum depth: 14 feet

Volume: Unknown

Contour map available: No

OHWM elevation: None set

Outlet elevation: None set

Lake elevation observed during the survey: Full

Beneficial use classifications: (6) warmwater marginal fish life propagation, (7) immersion recreation, (8) limited-contact recreation and (9) fish and wildlife propagation and stock watering.

Watershed area: 12.7 square miles

Mean depth: 4 feet

Shoreline length: Unknown

Date mapped: NA

Date set: NA

Date set: NA

Introduction

Italian railroad laborers working in the area named Cavour Lake for Count Cavour, an Italian statesman and father of Italian railroads. Water inputs come from a relatively small local watershed and the outlet empties into Pearl Creek and ultimately the James River.

Ownership of Lake and Adjacent Lakeshore Property

Cavour Lake is listed as meandered public water in the State of South Dakota Listing of Meandered Lakes. The South Dakota Department of Game, Fish and Parks (GFP) manages the fishery. GFP also owns and manages a Lake Access Area on the southeast corner of the lake and Game Production Areas on the north and south sides.

Fishing Access

The Cavour Lake Access Area on the southeast corner of the lake contains a single lane, concrete plank boat ramp and several areas suitable for shore fishing. A proposal to improve the access area has been submitted. The north side of the lake also contains several good shore fishing spots.

Field Observations of Water Quality and Aquatic Vegetation

The water in Cavour Lake was green and turbid with about 0.45 m (18 in) of visibility. No submergent or emergent aquatic vegetation was observed. Newly flooded small trees that grew during years of low water were observed near shore around the lake.

BIOLOGICAL DATA

Methods:

Cavour Lake was sampled on July 7-8, 2010 with three overnight gill-net sets and ten overnight trap-net sets. The trap nets are constructed with 19-mm-bar-mesh ($\frac{3}{4}$ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. The gill nets are 45.7 m long x 1.8 m deep (150 ft long x 6 ft deep) with one 7.6 m (25 ft) panel each of 13, 19, 25, 32, 38 and 51-mm-bar-mesh ($\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, and 2 in) monofilament netting. Gill-net and trap-net sites are displayed in Figure 4.

Results and Discussion:

Gill Net Catch

Black crappie (41.4%) and black bullhead (40.6%) were the most abundant species sampled in the gill nets (Table 1). Other species sampled included common carp and walleye.

Table 1. Total catch from three overnight gill net sets at Cavour Lake, Beadle County, July 7-8, 2010.

Species	Number	Percent	CPUE ¹	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Crappie	103	41.4	34.3	± 30.1	2.2	2	0	104
Black Bullhead	101	40.6	33.7	± 5.4	72.3	3	0	92
Common Carp	41	16.5	13.7	± 4.1	32.1	18	0	85
Walleye	4	1.6	1.3	± 1.1	12.0	--	--	--

* 5 years (2000, 2002, 2004, 2006, 2008)

¹ See Appendix A for definitions of CPUE, PSD, RSD-P, and mean Wr.

Table 2. Catch per unit effort by length category for various fish species captured with gill nets in Cavour Lake July 7-8, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Crappie	0.3	34.0	33.3	0.7	--	34.3	<u>+30.1</u>
Black Bullhead	1.0	32.7	31.7	1.0	--	33.7	<u>+5.4</u>
Common Carp	1.0	12.7	10.3	2.3	--	13.7	<u>+4.1</u>
Walleye	--	1.3	1.0	0.3	--	1.3	<u>+1.1</u>

Length categories can be found in Appendix A.

Trap Net Catch

Black crappie (83.9%), black bullhead (12.9%) and common carp (2.6%) were the most abundant species in the trap net sample (Table 2). Other species sampled included walleye, bluegill, yellow perch, and green sunfish.

Table 3. Total catch from ten overnight trap net sets at Cavour Lake, Beadle County, July 7-8, 2010.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Black Crappie	1,998	83.9	199.8	<u>+33.7</u>	43.7	1	0	95
Black Bullhead	307	12.9	30.7	<u>+5.6</u>	286.0	12	0	81
Common Carp	63	2.6	6.3	<u>+3.6</u>	10.6	14	0	87
Walleye	4	0.2	0.4	<u>+0.3</u>	2.2	--	--	--
Bluegill	4	0.2	0.4	<u>+0.5</u>	0.0	--	--	--
Yellow Perch	3	0.1	0.3	<u>+0.3</u>	0.2	--	--	--
Green Sunfish	1	0.0	0.1	<u>+0.1</u>	0.0	--	--	--

* 5 years (2000, 2002, 2004, 2006, 2008)

Table 4. Catch per unit effort by length category for various fish species captured with trap nets in Cavour Lake July 7-8, 2010.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Black Crappie	--	199.8	197.9	1.9	--	199.8	<u>+33.7</u>
Black Bullhead	7.6	23.2	20.5	2.7	--	30.7	<u>+5.6</u>
Common Carp	1.2	5.1	4.4	0.7	--	6.3	<u>+3.6</u>
Walleye	--	0.4	0.1	0.1	0.2	0.4	<u>+0.3</u>
Bluegill	--	0.4	--	0.4	--	0.4	<u>+0.5</u>
Yellow Perch	--	0.3	--	0.3	--	0.3	<u>+0.3</u>
Green Sunfish	--	0.1	--	0.1	--	0.1	<u>+0.1</u>

Length categories can be found in Appendix A.

Walleye

Management objective: To maintain a walleye population with a gill-net CPUE of at least 15, 25 cm (10 in) or longer fish in three out of five lake surveys.

Walleyes were stocked in Cavour Lake for the first time in 2003 and again in 2007. The few walleyes sampled this year appear to be from the 2007 stocking. It is uncertain why CPUE declined so dramatically from 2008 to 2010. Possibilities include a gill netting anomaly, downstream migration during recent flooding or abnormal natural mortality.

Table 5. Walleye gill-net CPUE, PSD, RSD-P, and mean Wr for Cavour Lake, Beadle County, 2001-2010.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CPUE		0.0		0.3		4.5		55.3		1.3
PSD		--		--		--		0		--
RSD-P		--		--		--		0		--
Mean Wr		--		--		--		87		--

Black Crappie

Management objective: Maintain a black crappie fishery with a trap-net CPUE of at least 20 and PSD of at least 40 in three out of five lake surveys.

Black crappie trap net CPUE increased significantly this year (Table 5) and all of the fish sampled were from a single year class produced naturally in 2007. Fish from this large year class are growing slowly and not reaching 20 cm (8 in) at age-3. Due to the high abundance and slow growth of the population, 6,383 crappies were transferred to other lakes in 2010. The flooding of terrestrial habitat by increasing water levels will likely benefit the crappie population for some time.

Table 6. Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Cavour Lake, Beadle County, 2001-2010.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CPUE		65.0		14.0		23.4		52.4		199.8
PSD		100		94		98		30		1
RSD-P		66		77		58		26		0
Mean Wr		105		100		98		118		95

Black Bullhead

Management objective: Maintain a black bullhead population with a trap-net net CPUE of less than 100.

Black bullhead CPUE continued to decrease and now meets the management objective. However, the fish are still small with a mean length of only 186 mm (7.3 in). Hopefully, the lower abundance will allow some bullheads to grow to a larger size.

Table 7. Black bullhead trap-net CPUE, PSD, RSD-P, and mean Wr for Cavour Lake, Beadle County, 2001-2010.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CPUE		502.2		233.8		129.8		120.0		30.7
PSD		65		9		3		51		12
RSD-P		2		0		0		0		0
Mean Wr		96		77		77		92		81
Mean Length		197		206		212		216		186

All Species

Bluegill and green sunfish appeared in this year's survey for the first time in the last ten years while white suckers have not been sampled since 2004. Common carp and black bullhead abundance is not a management issue at this time.

Table 8. Gill-net (GN) and trap-net (TN) CPUE for all fish species sampled in Cavour Lake, Beadle County, 2001-2010.

Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
COC (GN)		47.0		28.7		37.5		34.0		13.7
COC (TN)		25.8		2.0		17.4		6.4		6.3
WHS (GN)		--		--		--		--		--
WHS (TN)		--		0.4		--		--		--
BLB (GN)		76.5		55.0		16.0		3.3		33.7
BLB (TN)		502.2		233.8		129.8		120.0		30.7
YEB (GN)		--		--		--		--		--
YEB (TN)		--		2.6		0.8		0.2		--
NOP (GN)		13.0		3.0		--		--		--
NOP (TN)		2.8		3.4		1.6		--		--
GSF (GN)		--		--		--		--		--
GSF (TN)		--		--		--		--		0.1
BLG (GN)		--		--		--		--		--
BLG (TN)		--		--		--		--		0.4
BLC (GN)		2.0		0.7		1.5		6.7		34.3
BLC (TN)		65.0		14.0		23.4		52.4		199.8
YEP (GN)		3.0		0.3		--		--		--
YEP (TN)		0.2		--		0.2		0.6		0.3
SXW (GN)		11.5		0.3		--		6.3		--
SXW (TN)		0.4		1.4		--		0.6		--
WAE (GN)		--		0.3		4.5		55.3		1.3
WAE (TN)		--		--		2.6		8.2		0.4

COC (Common Carp), WHS (White Sucker), BLB (Black Bullhead), YEB (Yellow Bullhead), NOP (Northern Pike), BLC (Black Crappie), YEP (Yellow Perch), SXW (Saugeye), WAE (Walleye)

MANAGEMENT RECOMMENDATIONS

1. Stock walleyes as needed to achieve the management objective.
2. Conduct lake surveys every other year to monitor the fishery.

Table 9. Stocking record for Cavour Lake, Beadle County, 1988-2010.

Year	Number	Species	Size
1988	3,410	Black Crappie	Adult
1990	6,300	Yellow Perch	Fingerling
	650	Yellow Perch	Adult
	3,024	Black Crappie	Adult
	700	Northern Pike	Adult
	117	Channel Catfish	Adult
1992	7,500	Northern Pike	Fingerling
	15,213	Yellow Perch	Fingerling
1994	160,000	Saugeye	Eggs
	300,000	Saugeye	Fry
	5,888	Saugeye	Lrg. Fingerling
1995	2,300	Black Crappie	Adult
	2,315	Yellow Perch	Adult
1996	562	Saugeye	Adult
	2,238	Yellow Perch	Adult
1997	17,556	Yellow Perch	Fingerling
1998	34,328	Saugeye	Fingerling
	1,469	Saugeye	Juvenile
2000	2,300	Yellow Perch	Adult
2001	26,100	Saugeye	Fingerling
2003	58,800	Walleye	Fingerling
2007	23,180	Walleye	Fingerling

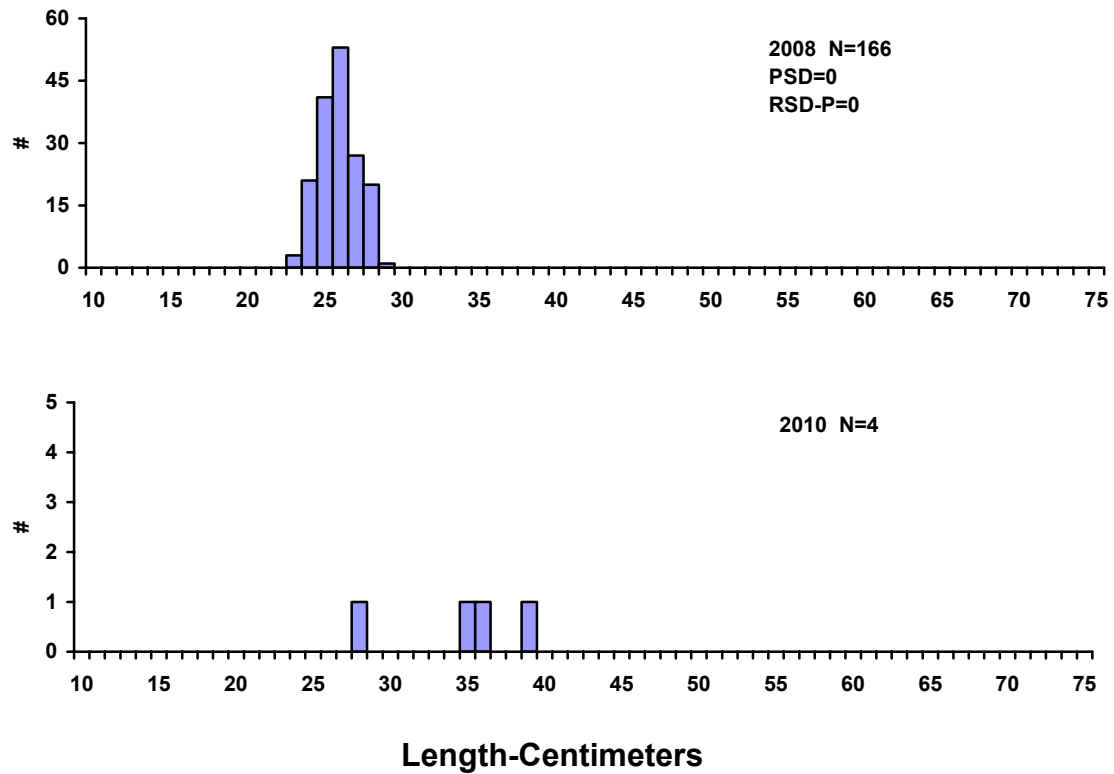
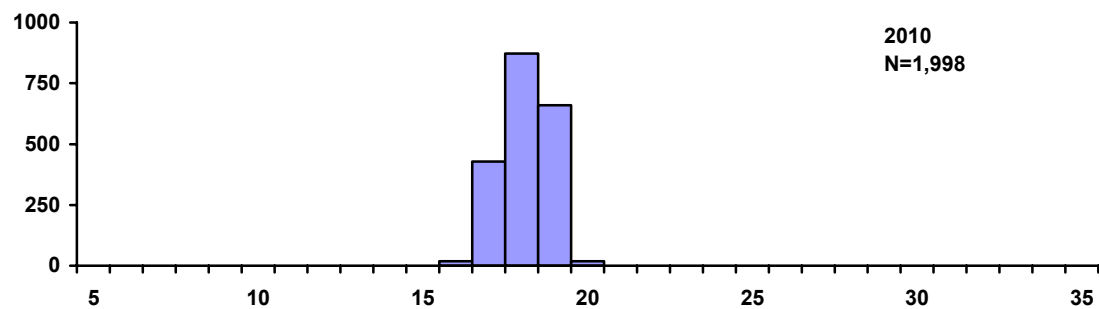
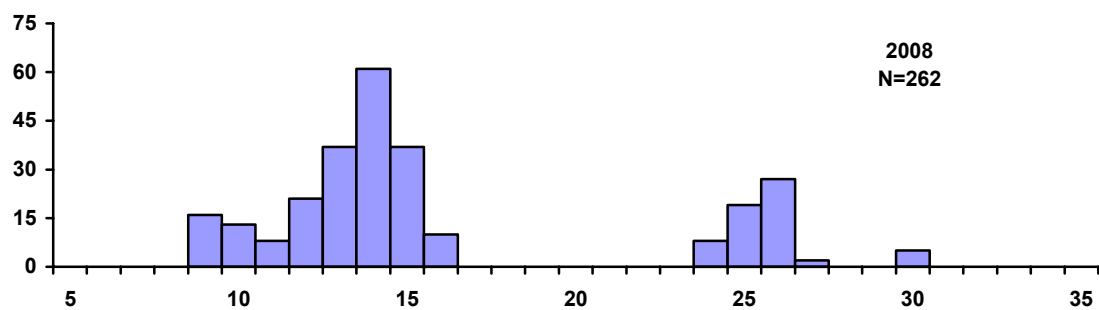
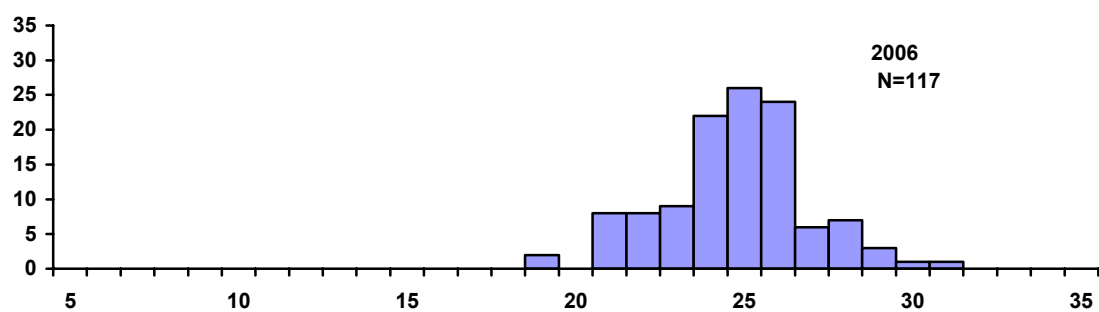
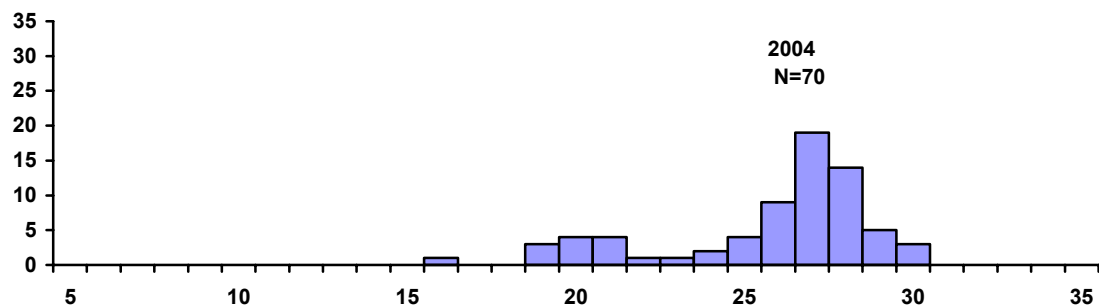
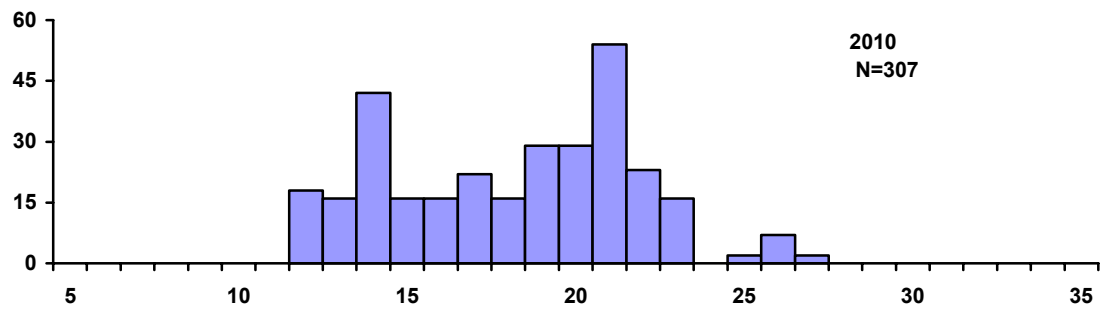
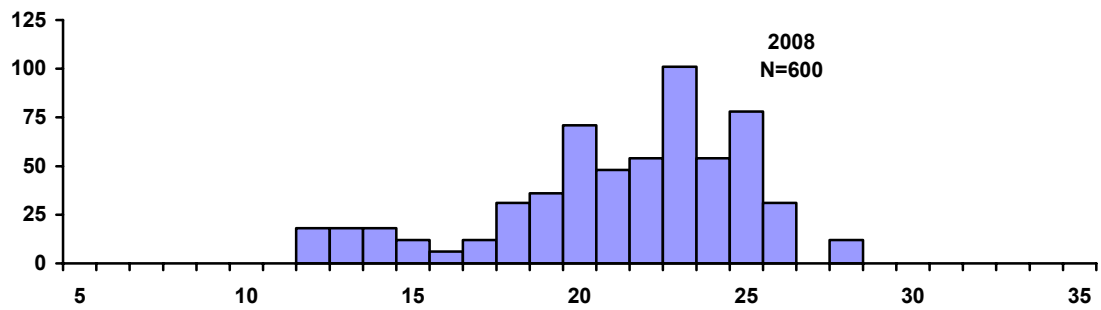
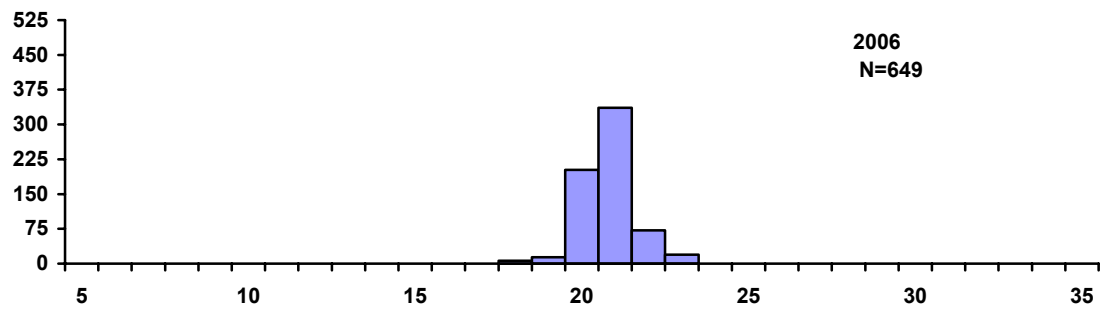
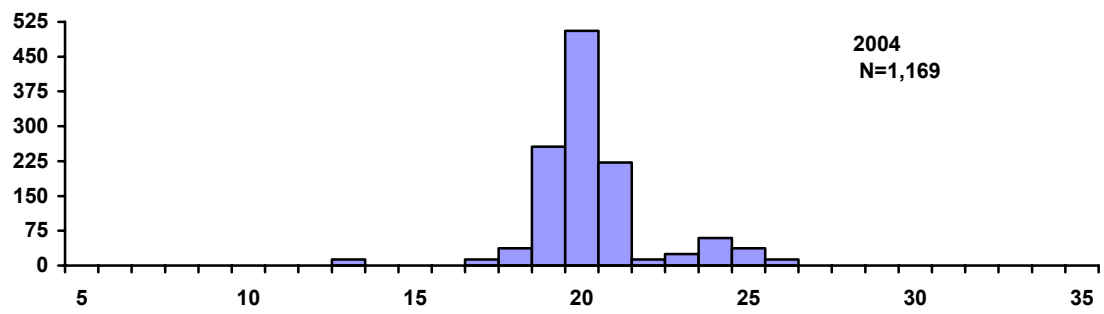


Figure 1. Length frequency histograms for walleye sampled with gill nets in Cavour Lake, Beadle County, 2008, 2010.



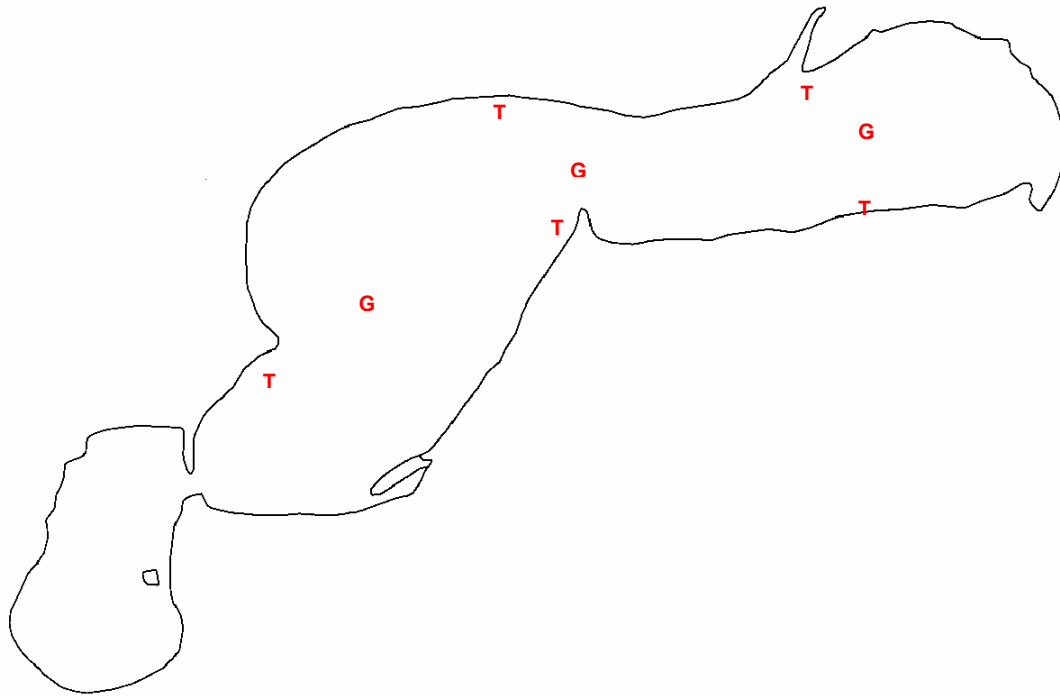
Length-Centimeters

Figure 2. Length frequency histograms for black crappies sampled with trap nets in Cavour Lake, Beadle County, 2004, 2006, 2008, and 2010.



Length-Centimeters

Figure 3. Length frequency histograms for black bullheads sampled with trap nets in Cavour Lake, Beadle County, 2004, 2006, 2008, and 2010.



Legend Gill Nets: G
Trap Nets: T

Figure 4. Sampling locations on Cavour Lake, Beadle County, 2010.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$\text{PSD} = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$\text{RSD-P} = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters (inches in parenthesis).

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25 (10)	38 (15)	51 (20)	63 (25)	76 (30)
Yellow perch	13 (5)	20 (8)	25 (10)	30 (12)	38 (15)
Black crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
White crappie	13 (5)	20 (8)	25(10)	30 (12)	38 (15)
Bluegill	8 (3)	15 (6)	20 (8)	25 (10)	30 (12)
Largemouth bass	20 (8)	30 (12)	38 (15)	51 (20)	63 (25)
Smallmouth bass	18 (7)	28 (11)	35(14)	43 (17)	51 (20)
Northern pike	35 (14)	53 (21)	71 (28)	86 (34)	112 (44)
Channel catfish	28 (11)	41 (16)	61 (24)	71 (28)	91 (36)
Black bullhead	15 (6)	23 (9)	30 (12)	38 (15)	46 (18)
Common carp	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)
Bigmouth buffalo	28 (11)	41 (16)	53 (21)	66 (26)	84 (33)

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.